**Department of Public Service**
**Recommendations for the Budget for the EEU 2006-2008**
**Corrected 05/17/06**

*Background and Overview*

With Act 61, the Legislature lifted the cap on the Energy Efficiency Utility ("EEU") budget and asked that the amount of the efficiency charge "…be reviewed for unrealized energy efficiency potential and shall be adjusted as necessary in order to realize all reasonably available, cost-effective energy efficiency savings." In establishing the budget, the Legislature asked the Board to "consider the impacts on retail electric rates of programs delivered." Together with the many interested parties, the Board is revisiting the 2006 budget levels for the EEU in compliance with this legislation.

The Department responded to the Board's review of the budget by preparing an analysis of *achievable potential* for energy efficiency and developed a model for estimating rate impacts. With this filing the Department summarizes findings, provides additional policy considerations, and offers its recommendations for the EEU budget for the next two and a half years.

In establishing the budget for the EEU, the Board should consider the findings of the *potential analysis* along with broader policy considerations that include rate impacts, effects on individual ratepayers, and related implications for promoting a healthy climate for employment. It will be important to phase in budget increases and constrain programs and measures to those that are *reasonably available* as established in the assessment of *achievable potential.* Included here should be concern for the practicality of various measures and overall fairness of the costs and benefits of efficiency programs on ratepayers across the board, including both participants and non-participants.

The Department presents its recommendations for the budget for the last 6 months of 2006 and for the 2007 and 2008 budgets. The Board should allow some opportunity for further budget revisions when setting the amount of the efficiency charge to 2007 and 2008. Some room should be left for modifications to the budget based on changing market conditions or the establishment of clearer objectives for targeted use of program funds.[1] Further as our comments will outline, there are important programmatic questions that should answered before long term funding commitments should be made.

These recommendations are made after having undergone an exhaustive analysis of the Achievable potential for energy efficiency and associated rate impact in cooperation with the many and varied interests that have committed time and resources to ensure that we

[1] Were the Board to do so, it should establish a clear schedule for revisiting the 2007 or 2008 at this time.

work from a solid base of sound information. We greatly appreciate the support and cooperation of others that lent assistance to the Department in this effort.

*Budget Recommendations:*

We recommend that the overall budget be set to no more than $23 million by 2008 based on our review of the *achievable potential*. We recommend that targets exclude any additional funding for fuel switching and that the current contract commitments for fuel switching be reviewed.

The Board should phase in the increases to ensure that the budget is increased in a manner that is not disruptive to current programs and activities, and not introduce an element of rate shock to consumers.[2] The Board should increase the budget to approximately $23 million in 2008, but allow opportunity for further comment and review of the Department's potential study in setting the 2007 and 2008 budgets.

Earlier in the year, the EVT was asked to present a phase in of a budget increase of a similar magnitude (30%).[3] We recommend the increases be phased in a manner that corresponds to the EVT proposal by increasing the budget by $.6 million in 2006, $1.9 million in 2007, and $2.8 million in 2008.[4]

| ***Costs*** | 2006 | 2007 | 2008 | TOTAL |
|---|---|---|---|---|
| ***Current EEU*** | $17.5 | $18.1 | $20.0 | $54.8 |
| ***Increase*** | $0.6 | $1.9 | $2.8 | $5.3 |
| ***Total*** | $18.1 | $20.0 | $22.8 | $60.9 |

An increase of this magnitude seems reasonable in light of current circumstance. However, the Board should confirm with EEU its ability to respond effectively to any proposed increase to the budget. Performance targets should be modified to conform to the additional savings.

*Summary of Achievable Potential:*

GDS Associates prepared the analysis of achievable potential for the Department. We included in our estimates of *achievable potential* only programs that lead to sustainable potential (i.e., had lasting impacts) and budgets. We recommend that the Board adopt a strategy of pursuing sustainable program activities in establishing the budget for the EEU.

[2] Recall that the proposed increases are occurring during the time in which many Vermont electric utilities are proposing rate increases, in large part due to higher prices on wholesale electric markets.
[3] EVT suggested an increase of approximately $1.4 million (under its scenario 1) to 2006, $3.3 million for 2007, and 5.5 in 2008.
[4] The current budgets for the EEU currently average $17.5 million over the contract period (2006 through 2008). However, budgets for EVT escalate from 16.7 in 2006 to 18.2 in 2008.

As a separate scenario, the Department reviewed the costs and savings of an early retirement scenario.

We concluded the following:

1. *Achievable potential* is approximately 19.4% (this includes fuel switching savings and reflects only electricity reduction as a percent of 2015 electric loads);
2. Additional cost-effective potential appears to exist for early retirement programs at a very high budgetary cost, and on a short term basis;
3. The annual budget necessary to support estimates of *achievable potential*, including fuel switching, are approximately $30.5 million;
4. The estimates of available potential rely on estimates of avoided costs for oil that are currently well below current market prices.[5]
5. The rate impacts of our *achievable potential* are roughly 2.4%, reflecting levelized estimates over 10 years from 2006 through 2015.[6]
6. The budget cost of fuel switching under the *achievable potential* analysis is roughly $7.7 million per year. However, oil and propane prices have risen significantly since the establishment of the new avoided costs and give rise to concerns about continuing a policy of promoting fuel switching as part of the EEU offerings. (Higher oil prices make fuel conversion less economic.)

*Background on Modeling Efforts and Analysis:*

The Department's analysis involved many hundreds of hours of analysis together with thousands of detailed questions of assumptions and analysis. It is built from a regional avoided cost study that occurred during the summer and fall of 2005 that established fuel price forecasts and estimates of avoided costs. Vermont last developed avoided costs for efficiency program purposes in 1997. These costs were adopted in 1999 in setting up the Efficiency Utility.[7]

The process of developing the *achievable potential* has required many intensive hours of work by qualified professionals whose work itself was subject to the review of other technical experts in Vermont that have also committed considerable effort to the review. In order to ensure quality and transparency, the Department has shared the detailed assumptions and the models of both potential and rate impacts to ensure a solid basis for fact and transparency. The GDS Model itself is roughly 80 MB of spreadsheet files that have been shared with all parties and is available on the Board web site.

[5] The forecast prepared by ICF shows costs for wholesale electricity and natural gas that are reasonably close to current price levels. However current oil prices are above $70 per barrel while estimates for 2006 were only slightly above $40 per barrel.

[6] GDS estimates that the levelized costs of the investments for the *achievable potential* are 7.1 cents/kWh under the total resource cost test and 4.45 cents/kWh under the utility test.

[7] Docket 5854, May 23, 1997 and approved in Docket 5980, Sept 30, 1999. On a going forward basis, the Department plans to update the estimates of avoided costs on a two-year cycle. The removal of the cap and the recent price volatility warrants a more frequent review and update.

The process has also required the detailed and painstaking work to screen hundreds of measures against five different economic tests, including the societal test, the total resource test, the utility test, the participants test, and measures of rate impacts.

This effort and the analysis underscore the complex nature of energy efficiency acquisition through the efficiency utility. Estimating budgets and efficiency potential is not a simple matter. Even with this extensive review, the Board with some degree of caution should consider the results. Uncertainty remains over measure costs and savings, future avoided costs, inflation, interest rates and other key input assumptions for the achievable potential estimates.

*Targeting Efficiency:*

Recall that the Vermont General Assembly, in passing Act 61, included provision for setting the energy efficiency charge after including "the value of targeting efficiency and conservation efforts to locations, markets or customers where they may provide the greatest value."

Targeted potential will be based on localized avoided costs. The GDS analysis applied a generic T&D avoided cost applicable to all statewide program initiatives. The Department is in the process of reviewing those generic T&D adders for purposes of establishing generic avoided costs. Where more localized T&D adders have been developed, they should replace the generic T&D adder. On a dollar for dollar basis such targeting may very well present a greater return of ratepayer capital on a statewide basis.

As a general matter, we conclude that programs should be targeted more toward areas that are near load centers and where growth is occurring. These are areas where most market driven efficiency opportunities will be greatest, and these are the areas where changes to the transmission system are most likely to occur.

The EEU should be given clear guidance and direction to target programs generally toward growth and new development. It is possible that VELCO's long-range transmission plan and other issues being discussed in Docket 7081 will, in the future, inform the targeting of programs.

As more information is developed, future EEU budgets could be informed by goals related to growth in peak demand.

*Early Retirement Programs:*

A special category of retrofit potential is early retirement retrofits. The Department's estimates of early retirement potential shows that this potential, while cost effective under the societal test, is available only at very high budgetary costs and for a short duration. The Department's analysis has also found that some efficiency measures are not cost effective if done on an early retirement basis. Due to the limited experience with these programs, assumptions about consumer behavior and program impacts are much more

speculative than are our estimates for sustainable program activities included in our *achievable potential*. We encourage the Board to pursue a path of sustainable program design.

We conclude broadly that these early retirement programs at current avoided costs are inappropriate for purposes of establishing a sustainable program design. The early retirement programs also do not result in kWh cumulative annual kWh savings by the end of 2015 that are much higher than replace on burnout programs, but the cost, annual budgets, and rate impacts of early retirement programs are dramatically higher. Early retirement programs, however, may be appropriate in a narrow set of circumstances, especially where demand reduction becomes a matter of some urgency.

*Incentive Payment Levels*

The Department has gone to some lengths in the report on *achievable potential* to emphasize the importance of limiting extraordinary levels of incentive payments. This is not merely a matter of prudent budget setting, but is a matter of sound program design. For our analysis, incentives were set at aggressive incentive levels of 50%. Our survey of other studies suggests this is aggressive but not excessive. This incentive level assumption is based not only our review of other efficiency potential studies recently conducted in the US, but also on the December 2004 National Energy Efficiency Best Practices Study.

Despite considerable program experience around the country, there appears to be little evidence of correlation between savings levels and budgets for the top energy efficiency organizations in the US. Further explanation of these findings seems warranted, but was beyond the scope of our review. Pursuit of greater efficiency is not merely a matter of budgeting, but is a matter of effective program design. This should be a matter of ongoing emphasis. Efficient and thoughtful program design and implementation, responsive to changing markets and consumer behavior, should be central to the establishment of future budgets.

*Fuel Switching*

The Department agrees with the conclusions of some commenters that highlighting the difference between the forecasted price of oil in our recently completed avoided cost analysis (see, http://www.publicservice.vermont.gov/pub/aescstudy.html) and current oil prices.[8] The high oil prices, and continued volatility in fossil fuel prices should cast

[8] An average of the LMP for the first four months of 2006 was approximately $67 per MWh. http://www.iso-ne.com/markets/hstdata/znl_info/monthly/smd_monthly.xls A simple average of the winter LMP established in the avoided Department's forecast was roughly $80 per MWh. Despite high oil prices, the cost of electricity is actually below forecasted levels.

In contrast, the Department's ICF forecast for Northern New England showed fuel oil selling for roughly $12.37 per MMbtu. Recent prices from the Department's fuel survey report for May 2006 shows a retail price of $2.60 or roughly $18.81 per MMbtu, (or $23,55 after adjusting for fuel conversion efficiency) or

considerable doubt about the appropriateness of targeting funds raised through the efficiency charge toward fossil fuel switching initiatives, especially oil.

While the Department has not, in the time available, re-screened fuel switching programs using current oil prices, we conclude that the economic and policy rationale should be questioned even if these programs continue to screen. Fuel switching in the current environment corresponds to moving consumers from a stable (albeit high priced) fuel source (electricity) to a very volatile one. The environmental consequences of fuel switching are also reason for pause.[9]

No added funds should be included beyond those already included in the current EVT contracts to pursue fuel switching to oil-based fossil fuels. And indeed the Board should consider whether funds currently used to promote fuel switching might better be directed toward more cost effective and appropriate energy efficiency measures.

Approximately 25% (or roughly $7.7 million) of the amount of efficiency potential identified in the GDS analysis is for fuel switching to fossil fuels. We recommend that this amount be deducted from the resource target determined in the A*chievable Potential and thus for* setting the budget going forward.

*Rate Impacts:*

The Department calculated and provided rate impacts for the *achievable potential*. The Department concludes that the rate impacts are roughly 2.4% based on levelized costs over 10 years of *achievable potential*. Although we acknowledge that rate impacts on individual consumers or particular rate classes can be greater. If the funding for fuel switching for fossil fuel sources is not included in the budget, then the estimates will be below this estimate. The rate impact analysis treated existing plans for the EEU under current contracts in a fashion similar to current embedded contracts with supply resources.[10] The overall rate impact of the early retirement scenario is much higher than the Achievable Potential base case. In contrast to the early retirement scenario, the initial four years of impacts were over 10% and were roughly 6% over the 10 years.[11]

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more than 52% above forecasted levels. This parallel's the differences between forecasted and actual crude oil prices.

[9] EVT tracks the impacts of program impacts of non-electric fuels only in relation to CO2 emissions. EVT also relies on externality adders for purposes of program screening. With respect to CO2 emissions, the environmental impacts are complex and should not favor fuel switching. As we move toward an environment where emissions are capped under the Regional Greenhouse Gas Initiative within the electric sector only, the fuel switch may not reduce emissions in the electric sector and may cause emission outside the sector. The consequences of fuel switching to other criterion pollutants are not apparent without closer examination.

[10] The estimates of rate impacts included the budgets and performance levels built into the current EVT contract. That is, the baseline rates included current plans and expenditures for EVT. Based on our model, these programs add approximately 2% for the current cost of service over the 3 years of the current contract from 2006-2008.

[11] These rate impacts can be mitigated to a degree by amortizing costs.

Rate impacts can be mitigated by amortizing costs. However, the Department does not recommend such a strategy. Amortization will, at a minimum, add to the nominal costs of the program associated with bonds that, in turn, could further impose on the credit of the State or other institutions required to back the bonds in order to secure reasonable credit terms.

*Transition Issues:*

We recommend that the Board increase the budget for the remaining 6 months of 2006 in a gradually phased manner along the lines of the phase-in plans contemplated by EVT in their presentation to the Board on March 3, 2006. A phase-in along those lines should allow for a managed transition.

Some caution should be exercised to sudden changes to the budget. Recall that the program targets for the Efficiency Utility were developed through a competitive process. Targets and performance incentives are important elements of the EEU process. In place of a competitive process, the Department and the Board will need to establish new targets informed by both the bid, by estimates of *achievable potential*, and revised budgets. We regard these targets as an integral and important element of both past and future performance.

*Uncertainties:*

As noted above, the modeling of energy efficiency involves thousands of assumptions and complex issues that have necessitated reliance on specialists in the field necessary to perform an analysis of this sort. The complexity of these efforts often obscure important differences between experts over important assumptions and our ability to effectively rely on energy efficiency as a resource.[12]

Important uncertainties associated with this analysis and estimates of savings potential include the following:

i. Participation levels and responsiveness to incentives;[13]
ii. Realized savings;[14]

[12] In presenting the uncertainties in the analysis associated with estimates of DSM potential, it is also important to acknowledge the risks and uncertainties associated with investments on the supply side. Those risks include risks of disruptions to fuel supplies, risks of price volatility, and market and investment risks to project owners and developers.

[13] Despite the logic of paying more to realize further savings, real world information provides a less compelling basis. The GDS analysis relies on an assumption of a 50% incentive of incremental cost is necessary to reach the *Achievable potential*. Others have argued that 100% is necessary to achieve the full potential. We conclude that 100% incentive levels raises fundamental concerns with program design. Meaningful customer contribution is necessary in most instances to ensure responsible consumer participation. Nevertheless, we acknowledge that there is considerable uncertainty around consumer behavior at either incentive level.

[14] Unlike metered supplies, efficiency claims of providers continue to suffer from the skepticism expressed by both critics and cautious supporters about the relationship between engineering estimates of savings and the resulting real world effects on kWh consumption.

iii. Free riders and free drivers;[15]
iv. Unintended program impacts;[16]
v. Savings levels and participation after the useful life of a measure has expired.[17]

*Further Context for Comprehensive Efficiency:*

Efficiency Vermont should be viewed as an integral and evolving element of a broader strategy to promote greater energy conservation and efficiency. However the Efficiency Utility is not the sole apparatus for delivering energy efficiency in Vermont. Rather, the Efficiency Utility exists within a broader context for efficiency that starts and ends with the consumer. Other elements of this broader mosaic include the following:

- Vermont electric and gas utilities have also played an important role in fostering efficiency through efficiency programs, interruptible contracts, and in cooperation with ISO-NE through demand-response initiatives. BED remains part of the Vermont's Efficiency Utility. Vermont utilities continue to play a role in delivering efficiency as part of its role in delivering programs intended to relieve local transmission and distribution constraints.
- During the current legislative session, the Vermont General Assembly adopted commercial building standards and user efficiency standards. These standards came on the heels residential building standards and of tax incentives and appliance standards embedded in the Energy Policy Act of 2005.
- In the future, the ongoing emergence of transparent wholesale markets coupled with important advances in meter reading technology and communications and rate design will play an ever increasing role in the delivery of and self provisioning of efficiency services. We believe that Efficiency Vermont can play an important role in helping to empower the ultimate consumers by allowing them to find innovative ways to manage their own use.

Other elements of the mosaic include third-party market-based delivery mechanisms, including performance-based contractors. But the consumer is the key.

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[15] Free riders refers to program participation by those that would be willing to purchase the more efficient measure even without the program or incentive. Free drivers refer to the spillover effects of the program in stimulating the development of markets and consumer efficiency beyond direct program participation.

[16] Programs that rely heavily on incentives, especially high levels of incentives, may be confronted with the unintended consequences from highly leveraged consumer purchases. Because there has been no systematic analysis of the problems or concerns, we rely on anecdotes. Common concerns include inefficient use of a 2nd refrigerator in response to aggressive incentive programs, the establishment of secondary markets for inefficient appliances with remaining useful life, purchases of surplus numbers of appliances (multiple window air conditioners) in response to strong incentives, and/or unused or inefficient use of compact fluorescent bulbs by consumers, or CFLs that move with renters.

[17] Effective and well-designed programs should encourage market transformation. Yet after more than 15 years of program delivery, the impacts of Vermont utility and Efficiency Utility programs toward this end still involved considerable uncertainty. The impacts of programs on consumers after the end of the useful life of measures purchased through the program remains the subject of considerable concern to utility planners and forecasters.

In Vermont, the EEU plays an important role, but that role should evolve with broader environment and leverage features of the environment. The EEU should complement and encourage efficiency services through these many avenues and do so in a manner that respects the concerns and impacts of both participating and non-participant consumers. In the future EVT staff should find new and innovative ways of leveraging incentives through loans, shared savings arrangements, and through the continuation and enhancement of strategic involvement of market delivery mechanisms that still overcome barriers, but with greater reliance on benefiting consumers to pick up a greater share of the costs. The Department looks forward to working with EVT in this regard and also with the Board at their discretion.

*LICAP and Regional Recovery:*

At this time, the budgets established for Efficiency Vermont should be established on the basis of the facts presented to date, including the analysis of potential and other important elements. As the region moves toward funding for energy efficiency programs based on their contributions to help reduce installed capacity needs of the region, Vermont can realize the benefits and offset the efficiency charge to Vermonters. At this junction we see no reason to account for these developments in the budget development of the EEU.